Information Item

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Agenda Item No.

City Manager's Approval

Report to the Auburn City Council

To:	Mayor and City Council Members
From:	Mark D'Ambrogi, Fire Chief
Date:	March 11, 2013
Subject:	Informational Item- Follow-up, Auburn Fire 2012 Incident Response Report, Medical Response

The Issue

This is a Staff follow-up report from the February 25, 2013 report on the 2012 Fire Department response and emergency incidents, specifically medical related incidents. No action is requested or required. This is informational only.

Conclusion and Recommendation

Staff has developed an overview of the fire department's medical emergency response, 2012 medical incident breakdown, current deployment to medical incidents, and cost analysis on medical response.

Background/Overview

Background on Emergency Medical Services (EMS) and the Fire Service

Ambulance service has been in existence for many years and initially began through private companies and or hospitals with the intent of transporting a sick or injured individual to a hospital emergency room in the quickest manner to initiate treatment. Ambulances were routinely staffed with "attendants" with limited knowledge or training on "pre-hospital" care as it is known today and provided limited first aid treatment to the patient while enroute to the hospital. Fire resources began responding with ambulances when situations were encountered that required additional specialized resources to assist such as fire and or hazardous conditions, vehicle accident extrication, technical rescue, or assistance in carrying a patient from area of injury to transporting ambulance. The Fire Service has a long standing history of responding to medical related incidents even when medical response was not part of the mission. In the late 1960's early 1970's, studies were conducted by health care professionals that indicated survival rates of patients transported by ambulance to local emergency rooms could be substantially enhanced if pre-hospital care; emergency medical treatment, be administered in a timely manner in the field and during transport to the hospital. This initiated medical training for EMS personnel; formally ambulance attendants, and fire personnel in the form of First Aid, Emergency Medical Technician (EMT), and Paramedics. The fire service, since already responding to many medical incidents along with ambulances, engaged in the delivery of

EMS response due to the fact that fire resources are strategically located throughout communities that provide for a quick response and could ultimately provide initial treatment in a timely manner that could result in a greater survivability rate for the sick and injured. Models of deployment for EMS were developed including fire departments engaging in complete advanced life support (ALS) response; treatment and transport, to private ambulance companies providing ALS treatment and transport. The most common model still used to day is a combination of local fire resources providing quick response with basic life support (BLS) supported by private ambulance transport providing ALS. A fire service model of EMS was the addition of a "squad"; smaller utility type vehicle, consisting primarily of 2 personnel that would respond specifically to medical emergencies. The ever popular 1970's TV series "*Emergency*" glamorized this model making it popular for the fire service. However, this was in addition to the 2-3 person staffed engine company that would also respond to many of those same incidents when additional personnel were needed. After a decade or so of this type of deployment it was realized that cost effectiveness and efficiency could be achieved by eliminating the additional response "squad" and personnel and deploy the already staffed and equipped engine to those same calls. This response deployment is most common, cost efficient and effective when combined with a private EMS ALS response and transport unit. In this model the fire resource can achieve a rapid response, provide lifesaving initial treatment, assist the EMS resource in packaging for transport, and remain in ready response mode for any additional incidents; medical or fire, in the local area.

Developing an EMS Response Deployment

Developing EMS response is very similar to developing fire response, it is based on worst case scenario utilizing the resources and staffing immediately available and local needs. Like with any fire situation an EMS response can be modified to increase the number of resources or reduce/cancel resources that are not needed. Although there are no federal requirements or protocols for response to medical related incidents other than personnel training and certification, there are a number of standards and recommendations to develop service response deployment to achieve the highest survivability rate from a serious medical situation. Many states and local Emergency Medical Service Authority's (EMSA) develop response criteria that best meet the needs of the local communities and therefore implement standards for 9-1-1 response to medical related emergencies. Some of these standards include:

- Recommendation of six (6) personnel; 2- Paramedics and 4 EMT's on trauma and cardiac related incidents
  (CFAI, IAFC, IAFF, NIST, and WPI)
- Recommendation of at least, 2- Paramedics and 2-EMT's on all medical related incidents
  (American Heart Association)
- Agencies providing first responder Automatic External Defibrillation (AED) services should arrive within 4 minutes 90% of the time
  (NFPA 1710)
- American Medical Response (Contract ALS provider for Placer County) response criteria- Auburn City and County area within ½ mile of the City of Auburn: Arrival within 8 minutes 90% of the time
  (SSV)

The recommended standards and response criteria are established to treat the most serious illness and injuries specifically related to trauma and cardiac related events. Such incidents pose a life threatening condition but with immediate pre-hospital care in the field initiated with BLS within the first 4-8 minutes a significant survivability rate may be achieved. National response data show that when fire resources and private ambulance providers are dispatched simultaneously the fire resources arrive prior to the ambulance 80% of the time. Therefore the first initial treatment is more often performed by the first responder fire resource.

Fire Department EMS Continue to Rise

Response to EMS calls by fire department resources continue to increase. Some departments are experiencing as high of a rate as 85% EMS response. Over the last decade increase in EMS have been attributed to: greater accessibility to the 9-1-1 system, greater awareness by the public that fire resources deliver EMS services in a timely manner, due to economic situations individuals are waiting longer to report a chronic illness or injury by which time turns out to be a serious EMS incident, and a decline of those covered by health care programs thus turning to the 9-1-1 EMS as a source of services.

Triaged Medical Calls

In 2010 Grass Valley Emergency Command Center, the center contracted by the City of Auburn for dispatching fire resources, implemented a triage system for medical related incidents known as ProQA. This system is a computer automated system that assists the call taker in determining the severity of the situation, allows to modify resource response, both in type and numbers- ALS vs. BLS, fire resource vs. private provider, provides instructions to the calling party of actions to take- CPR, control bleeding, etc., and obtain current up to date information on the patient as resources are responding. This process is performed at the same time resources are dispatched to an incident. Usually the call taker remains on the line with the party and triages the situation while another dispatcher dispatches resources. As conditions change information is transmitted to resources enroute and modifications made as appropriate. This is where a call may be downgraded to a code 2 or upgraded to a code 3 response. Code 2 calls are non-life threatening; proceed directly without lights and siren, may be diverted to a higher priority call. Code 3 calls are considered life threatening; proceed directly with lights and sirens, no diversion. Another important aspect of the ProQA system is that it is designed to triage calls of which may not warrant an EMS response by 9-1-1 providers and therefore recommends other means of services such as a doctor or clinic visit. This alone has reduced response of our fire resources since implemented. What is not recorded in statistics are the calls received by the dispatch center that do not require a dispatch of fire resources. The incident reporting systems only collects information on calls that actually incurred a response. As with any triage system it is only as good as the information that is provided. In situations there are a number of unknowns such as the caller did not witness the event, they happened upon it, or was asked to call 9-1-1. Important information such as mechanism of injury and how long the person has been down are critical to determine resource response. When such information is not known and sign and symptoms indicate possible trauma or cardiac the incident is treated as "worse" case scenario with full EMS response. Examples include: an individual down on the sidewalk, altered level of consciousness, difficulty breathing, non-verbal, non-witnessed event. To some is appears

like a simple fall, but what is unknown is the actual medical event; could it be cardiac related that caused the fall or did the fall cause trauma such as head injury. Another common incident is the elderly person fall. Typically this is a routine assist but ends up to be a life threatening situation for someone that suffered a broken hip with internal injuries as a result of that fall. Although there is a triage system in place that has eliminated many minor calls for service, reduces resource response, provides vital information for responders, and delivers step by step life-saving procedures for those at the scene, there will always be the "unknowns" that both fire and private EMS resources will always need to be ready for.

City of Auburn Fire Department Deployment Response to EMS Incidents

The City of Auburn Fire Department provides BLS first responder with AED capability for all medically related calls. All personnel are trained to BLS required standards as outlined through Sierra-Sacramento Valley EMS Agency (SSV, the EMSA for Placer County). BLS equipment is carried on the first out engines as well as the rescue. The department participates in the "two-tiered" EMS of which the fire resource responds BLS code 3 within 4 minutes 38 seconds average while private ALS transport unit responds code 3 within 8 minutes 90% of the time. Typically the fire department responds with the first out engine, 1284, because it is the staffed engine on a daily basis. When extra staffing permits or is available the rescue will respond to medical related incidents with two (2) personnel. A common question is why firefighters show up in the large engine to medical aids. "It's the same reason police wear guns while directing traffic – so they're prepared for other deployments" (Barnidge, 2013). Delivery of BLS with an engine allows personnel to provide medical service, have the necessary equipment needed and the ability to quickly move onto the next emergency no matter what it may be; fire, vehicle accident, or another medical aid. In a small agency staffed with 1 engine company it is necessary to utilize the engine for all calls, it is the "tool box" that you need for whatever might be encountered at any given time whether in the station or not.

2012 Medical Calls- Breakdown

The attached chart provides a breakdown of the medical calls responded to by the fire department during the 2012 calendar year. The fire department Record Management System (RMS) collects and status data based on the actual call that occurred not on what the initial dispatch described. This often will result in a change of response, code 2 or code 3, and classification of the actual incident. An example can be the perceived heart attack dispatched to and by triaging additional info is obtained resulting with an individual stressed or with anxiety. Of the 1202 medical calls for the 2012 calendar year 272 or 23% resulted in code 2 response of which is a significant increase mainly due to the triage process used at the dispatch center.

Auburn Fire Department 2012 Medical Calls	
Description/Type	**Number**
300[1]- Assist the ALS Resource Only *Fire resources assist the ALS unit for package/transport only*	45
311[1]- Assist the patient, no ALS required or used *Patient assistance and assessment, basic medical check out, no further required*	79
320[1]- Medical Check out, Released to ALS *Medical check by fire, released to ALS for further treatment, non- life threatening*	36
321[2]- Medical Aid Requiring EMS services *Trauma, cardiac, illness, potential life threatening, serious event requiring transport*	1042
TOTAL	**1202**

[1]Code 2 response unless other information given on dispatch or enroute

[2]Code 3 response unless other information given on dispatch or enroute

Auburn Fire Department Current Augmented Staffing and Response to Medical Calls

Due to receipt of the SAFER DHS/FEMA grant and the addition of 5 personnel, augmented staffing of the rescue is occurring 67% of the time. The primary response of the rescue staffed with 2 personnel BLS is to medical incidents. This response deployment creates an added capability to the department in that the engine company does not respond unless requested or needed for additional personnel or specialized services: extrication, rescue, hazard mitigation, etc. and remains in service to take any additional calls for service and or continue in daily operations and special projects. Over a three (3) month period, of which is a small data sampling, the following is derived showing the response of rescue 1252 and engine 1284 to medically related calls. It is anticipated that rescue 1252 will be normally staffed with 2 personnel on a daily basis once all SAFER positions are filled completely thus reducing the amount of response engine 1284 with 3 personnel will have to medical calls. Engine 1284 will still incur responses to medical calls when rescue 1252 is already committed, thus reducing the number of times the city will rely on the neighboring fire jurisdiction for response. Since statistical information shows that between the hours of 8am and 8pm are the heaviest occurrence of calls, this is the primary target period for augmented staffing of rescue 1252.

Three Month Period of Medical Calls *(11/2012. 12/2012 & 01/2013)*	
Total Number of Medical Calls	347
Number of Responses by Rescue 1252[1]	137
Number of Responses by engine 1284	210
Number of Code 2 Responses	80

[1] Rescue 1252 is a 1993 International 1 ton commercial cab with utility box that carries medical equipment, extrication equipment, the air cascade system, lighting, and miscellaneous tools and SCBA (2), staffing is limited to two (2) personnel.

Auburn Fire Department Cost Analysis for Response to EMS Incidents

Analysis is provided to identify costs associated with fire department response to EMS incidents.

Analysis 1 identifies the direct costs associated to response excluding personnel costs. This is based on the assumption that personnel on duty costs are the same regardless if they respond to such EMS incidents or not.

Analysis 2 includes the direct costs as well as personnel "on duty" costs of which are applicable in the development of a "fee for service" schedule.

Analysis #1		
Items/Description	Costs	
	Rescue 1252	Engine 1284
Equipment Used[1]	$10.00	$10.00
Vehicle Maintenance[2]	$17.50	$22.50
Fuel[3]	$6.00	$8.00
TOTALS	$33.50	$40.50

[1] Includes personnel protection equipment, medical oxygen, and cleaning supplies; averaged based on normal operating costs (other medical equipment is replaced by the ALS unit at scene; exchange program)
[2] Using Cal EMA/OES FEMA reimbursement rates for .25/hour; travel/response time
[3] Based on price of fuel at this time and unit estimated consumption

Analysis #2		
Items/Description	Costs	
	Rescue 1252	Engine 1284
Equipment Used[1]	$10.00	$10.00
Vehicle Maintenance[2]	$17.50	$22.50
Fuel[3]	$6.00	$8.00
Station Officer[4]	N/A	$23.63
Firefighter/Engineer[4]	$21.19	$21.19
Firefighter[4]	$15.74	$15.74
TOTALS	$70.43	$101.06

[1] Includes personnel protection equipment, medical oxygen, and cleaning supplies; averaged based on normal operating costs (other medical equipment is replaced by the ALS unit at scene; exchange program)
[2] Using Cal EMA/OES FEMA reimbursement rates for .25/hour; travel/response time
[3] Based on price of fuel at this time and unit estimated consumption
[4] Based on Department's rates on file with Cal EMA/OES reimbursement salary schedule at 1 hour time; includes response, clean-up/re-stock, and report writing

Summary

While the response to medical related calls by the fire department continue to increase there are a number of calls originating at the dispatch center that do not warrant an EMS response by local fire resources and thus reduce response by fire based EMS. In addition, by triaging calls the most accurate information can be provided to responding resources which can adjust the number and type of resource needed and perhaps eliminate the need for fire resources. The two tiered system of fire based resources coupled with private resources for EMS delivery provides the most efficient means of pre-hospital care in that taxed based resources, fire, can respond in a timely manner and provide life saving measures and are used for a short time duration. The private ALS transport resources are fee based with such costs borne by the end user based on the actual service received. Because of the SAFER grant and 5 additional personnel the fire department is able to develop EMS deployment in an effective manner without any additional costs. By sending a rescue and two personnel costs are actually reduced compared to sending the staffed engine company. The ability to modify EMS response greatly enhances the level of services provided to our citizens by having two resources able to respond to calls for service. In the future when SAFER funding is no longer available it would be worthwhile to analyze what alternative response can be developed and the associated costs. The level of EMS response like any emergency response is based upon policy by local elected officials driven by needs of the community. Deployment models can vary due to constraints on personnel, equipment, and apparatus, and are designed to deliver cost efficient and effective services. A public/private EMS deployment offers a high level of service, keeps costs down for private services, and does not completely rely on publicly funded resources for services.

References

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